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**Resonant x-ray scattering study of tilt ordering in  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$**

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The structural phase transition between the high temperature tetragonal phase and the low temperature orthorhombic phase of  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$  has been studied extensively since the discovery of superconductivity in these compounds [1-4]. This phase transition is characterized by the tilting of the  $\text{CuO}_6$  octahedral unit along the orthorhombic [100] direction. In the tetragonal phase, the average static tilting disappears. However, it was shown that the octahedral tilting persists locally and dynamically into the tetragonal phase. We have carried out an x-ray scattering investigation of the global coherence of the local octahedral tilt ordering in these compounds by tuning the incident x-ray energy to the  $L_I$ ,  $L_{II}$  and  $L_{III}$  absorption edges of La, and studying the (010) peak, which is a forbidden reflection. The octahedral tilt ordering in these compounds persists above the structural phase transition temperature, which is determined by monitoring the orthorhombic superlattice peak intensity. We have also studied the energy dependent profile as well as the azimuthal dependence of the cross-section.

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